ON SCENE

THE NATIONAL MARITIME SAR REVIEW

MERSAR REVISITED

In 1970 the Inter-Governmental Maritime Consultative Organization (IMCO) published a Merchant Ship Search and Rescue Manual (MERSAR) to provide guidance for merchant ships of the world when participating in search and rescue operations. This manual is published in the United States by the Coast Guard as Part I of IMCO Search and Rescue Related Publications (CG-421).

All search and rescue personnel in maritime areas should be familiar with MERSAR because it provides a simple way of coordinating search and rescue activities with merchant ships. Did you know that by using MERSAR you can:

1. Call a ship's attention to procedures to be used for the evacuation of persons by helicopter. (Paragraph 2.4.2);

2. Direct the merchant ship on the proper preparations to make while proceeding to assist another ship (Chapter 3);

3. Put a merchant ship in charge of joint surface operations with other merchant ships by requesting him to assume the duties of Coordinator of Surface Search (CSS) (Chapters 3, 4, and 5);

4. Describe merchant ship search patterns by number (Chapter 4);

5. Direct attention of merchant ships to procedures to be used during the rescue phase (Chapter 6);

6. Get a bird's eye view of the communications limitations of merchant ships (Chapter 6);

7. Direct a merchant ship's attention to procedures to be used in respect to aircraft casualties at sea (Chapter 7).

The forward to the U. S. edition of MERSAR urges all ship masters and ship officers to become familiar with MERSAR and to keep it readily available for use during emergencies at sea and that by means of MERSAR and the International Code of Signals (INTERCO) it is expected that ships of any nationality will be able to coordinate their activities during a search and rescue operation. Needless to say, MERSAR and INTERCO can be just as important to professional search and rescue personnel for these same purposes. A familiarity with both publications is essential.

ON SCENE is a SAR publication published by the Commandant, U. S. Coast Guard as a source of information concerning current and proposed procedures as well as new developments in SAR. Articles contained herein are non-record and non-directive.

DEPARTMENT OF TRANSPORTATION
U. S. COAST GUARD

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ASSUMPTIONS vs FACTS

In a previous Case Study (SOPINKET KAISER - ON SCENE ISSUE 1-74) a caution was given that we should view our assumptions with a healthy skepticism and check them out whenever possible in order to replace them with facts. Sometimes a seeming fact turns out to be grossly incorrect. This occurred in the case described in our last issue (ON SCENE 1-75), when a radio transmission of a distressed vessel's position given as "4 to 5 miles" off a point of land was heard as "42 miles". An almost identical situation from about a decade ago turned up recently where the vessel's position was given as "3 to 5 miles" off a point but was read as "35 miles".

The 7th Coast Guard District RCC Handbook handles the problem with the following words:

"The search planner must learn to separate facts from assumptions; otherwise, his entire search plan could be negated by an erroneous assumption disguised as a fact. A fact is verifiable. The search planner should ask himself these questions:

How do I know this bit of information is a fact?

Who says so?

How does he know?

Is he the original source of the information or did he get it from some other party?

If the planner is not suspicious by nature, he must learn to be so. He must make every effort to get to the original source of information."

Another practice prescribed in the 7th District RCC Handbook is that of writing down those assumptions on which the search plan is based. The Handbook directs as follows:

"Assumptions are necessary. The planner must make assumptions in planning every search. The important thing is to recognize what assumptions he is making, including the ones he is making unconsciously. The search planner must write down his assumptions in an orderly way, using the specially designed Miami RCC Assumption Sheet. The search planner shall complete this form and attach it to the drift computation sheet to which it pertains. For every change in assumptions, he must prepare a new form and start a new drift computation sheet."

The value of this practice of recording the assumptions with each change in search planning has been demonstrated several times in SAR case studies in which the 7th District has been able to reconstruct an evolving case stretching over several days of search. The following is a series of assumptions used to plan the sea searches for a missing outboard.

FIRST DAY ASSUMPTIONS

1. Boat probably disabled and adrift. Maximum peril considered to be breakdown in position 210° 35 miles from the sea buoy off Big Marco Pass.

2. Because the weather had not been unusual or dangerous, the possibility of capsizing was assigned a low probability.

3. The boat carried flares, or running lights were operating.

4. Leeway 6% of wind velocity and downwind.

SECOND DAY ASSUMPTIONS

1. Boat probably disabled and adrift, possibly capsized. Probabilities heavily weighted in favor of boat being disabled and not capsized.

2. Leeway 6.7% of wind velocity and downwind.

THIRD DAY ASSUMPTIONS

1. Boat either disabled and adrift or capsized and adrift. No justification for assigning a higher probability to the capsizing scenario because previous experience extending through many searches, taught that search aircraft frequently miss targets smaller than 20' long, despite reported high PODs.

2. Leeway 6% of wind velocity and downwind.

FOURTH DAY ASSUMPTIONS

Same as previous day

FIFTH DAY ASSUMPTIONS

1. Same as before, with a higher probability that the boat had capsized or sunk. Unable to dismiss the possibility the boat was still afloat, because of our previous experience with missed targets.

SIXTH DAY ASSUMPTIONS

1. Same as before.

2. After the capsized boat and survivor were located, search target was assumed to be people in the water.

SEVENTH DAY ASSUMPTIONS

1. Search target people in the water, possibly in life jackets.

2. No leeway.

Although, in this case, the assumptions at the start were not correct (the boat had capsized before the first day's search), the possibility of capsizing began to take effect on planning from the second day of the search onward. The practice of recording the assumptions not only fostered a logical approach to the search planning process but also made it possible to conduct a thorough review and study of this case. The excellent documentation of the search planning sequence provides an outstanding addition to the fund of experience to be called upon in future cases.

REVISED SAR COURSE AVAILABLE

The Coast Guard Institute is now offering a newly revised edition of the Search and Rescue Correspondence Course. This is a self-scoring course consisting of an assignment book with 19 lessons and a pamphlet with 4 SAR problems. The questions in the lessons are multiple choice, true-false, fill in the blank, and question and answer. Each lesson takes approximately 1 hour to complete. The references for the course are the latest edition of the National Search and Rescue Manual (CG-308), the U. S. Coast Guard Addendum to the National SAR Manual and Aircraft Emergency Procedures Over Water (CG-306). Upon completion of the entire course, an end-of-course test will be administered by the unit Educational Services Officer.

The Coast Guard requires that all officers reporting for duty as RCC Controllers must complete either this course or the resident course at the National SAR School in New York. Other Coast Guard personnel engaged in SAR such as Assistant RCC Controllers, aviators, and line officers on SAR vessels will find that this course will significantly enhance their professionalism. Application for enrollment should be made through the unit Educational Services Officer. Army, Navy and Air Force personnel engaged in SAR may apply for enrollment, through their education officer, to:

Commandant (G-PTE-2)
Coast Guard Headquarters
Washington, D. C. 20590

ELT ADF...Contd from page 4

The estimated position of the crash site was computed by "averaging" the two pattern positions and correcting for the INS error. The crash was located 0.7 nautical miles from this corrected position. Although three persons perished in the crash, two were saved thanks to the ELT, the C-130 CGNR 1452, the Army helicopters and the Sheriff's Ground Party. "Well done " to all concerned.

SAR MEETINGS

April is the month for SAR Meetings this year as witness the following schedule:

9 April	Interagency Committee on Search and Rescue (Washington, D. C.)
11-12 April	National Association of SAR Coordinators Board (Salt Lake City, Utah)
22-25 April	Atlantic SAR Seminar 1975 (New York City)

ELT ADF HOMING PROCEDURES

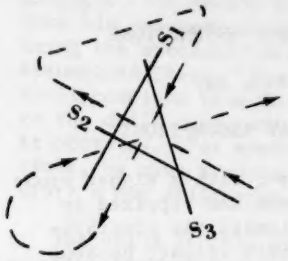
Locating a unit in distress putting out an ELT or EPIRB signal doesn't sound like much of a challenge for an ADF-equipped aircraft. All you do is home in until you get needle reversal, and if you haven't already spotted the target, make a procedure turn, let-down, and "There he is." But if the weather and terrain don't cooperate, then what? The homing patterns in CG-308 are designed for "receiver only" use. What procedure would you use to exploit your ADF capability?

Recently a C-130 from CGAS San Francisco faced this problem in locating a crash in extremely rugged terrain east of Seattle in very bad weather conditions. When the weather improved on the third day, Army helicopters and the local Sheriff's Department were able to make the rescue using the estimated position calculated by the C-130, CGNR 1452. Here is San Francisco's report:

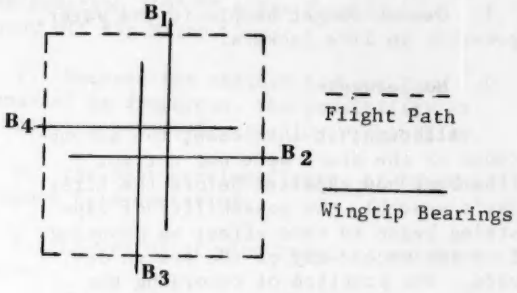
"Upon arrival in the area of the estimated position, CG 1452 was able to hear and home on the ELT. An approach course to the ELT of 300 degrees True was taken since it would overfly the valley near the estimated position. Aircraft altitude was 12,000 ft. due to high terrain and ATC restrictions.

"CG 1452 flew toward the beacon on the 300 degrees True course until the ADF needle swung. The swing point was plotted and a perpendicular drawn to the course line. The aircraft proceeded outbound for about 2 minutes, then turned right and maneuvered to fly inbound on a course of 210 degrees True until needle swing. The aircraft continued outbound another 2 minutes, turned right 90 degrees and maneuvered to fly inbound on a course of 075 degrees True until needle swing. By marking each needle swing with a perpendicular to the course line, a triangular area of highest probability was determined.

"The below needle-swing pattern was repeated using a different starting course.



"Because of the mountainous terrain and resultant poor-definition needle-swings, a bearing-fix was also obtained. A square pattern 12 NM on a side was flown around the needle-swing EP. Altitude was adjusted to 10,000 ft. The pattern was flown on autopilot, coupled to the INS. Wingtip bearings were obtained. This produced a square of highest probability. This pattern was repeated three times. Bearings other than wingtip-type were taken for confirmation.



"After completion of the square-bearings pattern, random bearings were obtained from further away, and needle-swing passes were made up and down the valley in which the EP was located. The DF bearings and needle-swings throughout the search were not well-defined. Generally at least two needle swings were observed on each pass and bearings were not steady. This was undoubtedly due to the mountainous terrain and snow-covered ground reflection/refractions."

When CGNR 1452 landed at McChord AFB after the search, the inertial navigation system error was determined to be 4.1 nautical miles southeast of actual position after 4.7 hours of flight.

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